

THAT WHICH IS CLAIMED IS:

1. An isolated DNA molecule having a nucleotide sequence selected from the group consisting of:

(a) SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:4, SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:9, SEQ ID NO:10, SEQ ID NO:11 and SEQ ID NO:13; and

(b) sequences that hybridize to isolated DNA of (a) above under conditions represented by a wash stringency of 0.3M NaCl, 0.03M sodium citrate, and 0.1% SDS at 60°C, and which encode a matrix attachment region.

2. A DNA construct comprising:

(a) a transcription initiation region and a structural gene positioned downstream from said transcription initiation region and operatively associated therewith; and

(b) a matrix attachment region according to claim 1 positioned either 5' to said transcription initiation region or 3' to said structural gene.

3. A DNA construct according to claim 2, wherein said matrix attachment region is 5' to said transcription initiation region.

4. A DNA construct according to claim 2, wherein said matrix attachment region is 3' to said structural gene.

5. A DNA construct according to claim 2, further comprising a second matrix attachment region that differs in sequence from said matrix attachment region according to claim 1.

6. A DNA construct comprising:

(a) a transcription initiation region and a structural gene positioned downstream from said transcription initiation region and operatively associated

therewith;

(b) a matrix attachment region according to claim 1 positioned either 5' to said transcription initiation region or 3' to said structural gene; and

5 (c) a second matrix attachment region according to Claim 1, wherein said second matrix attachment region is positioned either 5' to said transcription initiation region or 3' to said structural gene.

7. A DNA construct according to claim 2, further comprising a termination sequence positioned downstream from said structural gene and operatively associated therewith.

8. A DNA construct according to claim 2, wherein said first and said second matrix attachment regions differ in sequence.

9. A vector comprising a DNA construct according to claim 2.

10. A vector according to claim 9, wherein said vector is selected from the group consisting of plasmids, viruses, and plant transformation vectors.

11. A host cell containing a DNA construct according to claim 2.

12. A host cell according to claim 9, wherein said host cell is an animal cell or a plant cell.

13. A transgenic plant comprising transformed plant cells, said transformed plant cells containing a DNA construct according to claim 2.

14. A transgenic plant according to claim 13, which is a monocot.

15. A transgenic plant according to claim 13, which is a dicot.

16. A transgenic plant according to claim 13, which plant is a dicot selected from the group consisting of tobacco, potato, soybean, peanuts, cotton, and vegetable crops.

17. A DNA construct comprising, in the 5' to 3' direction, a transcription initiation region, a structural gene positioned downstream from said transcription initiation region and operatively associated therewith, and a matrix attachment region positioned either 5' to said transcription initiation region or 3' to said structural gene, wherein said matrix attachment region has a sequence selected from SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:4, SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:9, SEQ ID NO:10, SEQ ID NO:11 and SEQ ID NO:13;

10 said DNA construct carried by a plant transformation vector.

18. A DNA construct according to claim 17, further comprising a second matrix attachment region that differs in sequence from said matrix attachment region.

19. A recombinant tobacco plant comprising transformed tobacco plant cells, said transformed tobacco plant cells containing a heterologous DNA construct comprising, in the 5' to 3' direction, a transcription initiation region functional in plant cells, a structural gene positioned downstream from said transcription initiation region and operatively associated therewith, and a matrix attachment region positioned either 5' to said transcription initiation region or 3' to said structural gene,

5 wherein said matrix attachment region has a sequence selected from

10 SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:4, SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:9, SEQ ID NO:10, SEQ ID NO:11 and SEQ ID NO:13.

20. A method of identifying matrix attachment regions in a DNA molecule of known nucleotide sequence, comprising identifying a sequence section of at least twenty contiguous nucleotides that is at least 90% A or T nucleotides, wherein the presence of such a sequence section indicates a MAR encompassing said sequence
5 section.

21. A method according to claim 20, further comprising preparing a MAR molecule of at least about 300 nucleotides, said MAR having a sequence which is a contiguous fragment of said DNA molecule sequence and which encompasses said identified sequence section of at least twenty contiguous nucleotides that is at least
5 90% A or T nucleotides.